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Title : Seasonal changes in foraging ecology of lactating subantarctic fur seal (*Arctocephalus tropicalis*) and its relation with maternal characteristics and pup growth performances at Amsterdam Island

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Abstract : Seasonal changes in marine ecosystems directly affect spatial distribution and availability of marine resources. They are thus likely to influence maternal foraging provisioning and efficiency patterns, and subsequent pup growth rate of central place foragers such as otariids. While previous studies have documented foraging locations and diving activity of female otariid seals in relation to oceanographic features, few have focussed on those of long-lactating fur seal species. The present study investigated seasonal changes in foraging ecology patterns in relation to oceanographic features and maternal characteristics: foraging grounds (using satellite tags, geolocation, GIS and Kernel estimation techniques), at-sea activity budget (using time depth recorder), foraging success and diet of female subantarctic fur seals (*Arctocephalus tropicalis*) breeding on Amsterdam Island (southern Indian Ocean). The seals mainly exploited the Subtropical Front but exhibited large seasonal distribution changes: from short trip in restricted foraging areas during summer to widely distributed winter foraging grounds. Consistent with this is the seasonal shift in diet (from *Myctophum phengodes* and *Symbiolophorus* sp. to *Electrona paucirastra*) and increasing proportion of time diving and resting. Increase in foraging trip duration and distance from the rookery (respectively 16 ± 4 days, 633 ± 156 km trip in summer and 31 ± 8 days, 1125 ± 484 km trip in winter) is concomitant with decreasing maternal mass gain rate and consequent pup growth rate. These results suggest a decrease in food availability throughout the seasons. During the summer, maternal rate of mass gain and pup growth were related to foraging tactics (percent of time diving and spent in the core foraging area), whereas maternal characteristics such as body length, but not age, were more important during the latter months of the pup-rearing period. Compared to previous studies on Amsterdam Island, the longer foraging trip duration and lower pup growth rates suggest that this population may be reaching carrying capacity.